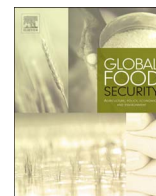




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Review Article

Tapping the economic and nutritional power of vegetables

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ABSTRACT

Vegetables are increasingly recognized as essential for food and nutrition security. Vegetable production provides a promising economic opportunity for reducing rural poverty and unemployment in developing countries and is a key component of farm diversification strategies. Vegetables are mankind's most affordable source of vitamins and minerals needed for good health. Today, neither the economic nor nutritional power of vegetables is sufficiently realized. To tap the economic power of vegetables, governments will need to increase their investment in farm productivity (including improved varieties, alternatives to chemical pesticides, and the use of protected cultivation), good postharvest management, food safety, and market access. To tap the nutritional power of vegetables, consumers need to know how vegetables contribute to health, and find them at affordable prices or be able to grow them themselves. Vegetable consumption must therefore be nurtured through a combination of supply-side interventions and behavioral change communication emphasizing the importance of eating vegetables for good nutrition and health. To fully tap the economic and nutritional power of vegetables, governments and donors will need to give vegetables much greater priority than they currently receive. Now is the time to prioritize investments in vegetables, providing increased economic opportunities for smallholder farmers and providing healthy diets for all.

1. Introduction

Food security has long been associated with a vision of an abundance of grains, roots, and tubers – the staple crops that provide affordable sources of dietary energy. But this picture is changing as the concept of nutrition security has become embedded in that of food security and the importance of dietary diversity for good health has moved to the fore. Healthy, high-quality diets require the consumption of a wide range of food categories in the right quantities. Globally, the prevalence of hunger has declined to 795 million in 2015 (FAO et al., 2015), indicating progress in ensuring adequate access to staple foods as measured in terms of caloric intake. But an estimated 2 billion people are affected by insufficient intakes of micronutrients (WHO, 2016) and a further 2.1 billion people are overweight or obese (Ng et al., 2014).

Fruits and vegetables are essential sources for the micronutrients needed for healthier diets. Potassium in vegetables helps to maintain healthy blood pressure, their dietary fiber content reduces blood cholesterol levels and may lower the risk of heart disease, folate (folic acid) reduces the risks of birth defects, and vitamin A keeps eyes and skin healthy, while vitamin C not only keeps teeth and gums healthy but also aids in iron absorption. Recognizing the important nutritional benefits of fruits and vegetables, the

World Health Organization (WHO) recommends a minimum intake of 400 g per day to prevent chronic diseases (especially heart diseases, cancers and diabetes) and supply needed micronutrients (especially calcium, iron, iodine, vitamin A and zinc) (WHO, 2015; WHO/FAO, 2003). However, consumers today, even those with higher incomes, are believed to be missing this target. More attention to filling this dietary gap and enabling consumers to tap the nutritional power of vegetables is required.

Expansion of fruit and vegetable production is an obvious first step. Growing populations and increased incomes, especially in urban areas, are already creating a rise in market demand as consumers seek to diversify their diets. Increasing vegetable production to respond to this demand creates important economic opportunities, especially for smallholder farmers. Data for Cambodia, Niger, and Vietnam show that profits per hectare are 3–14 times higher in vegetable production than in rice production while profits per labor-day are double (Joosten et al., 2015). Vegetables also typically provide more employment per hectare than cereals. Weinberger and Lumpkin (2007) showed that vegetable production in six Asian countries used on average 297 labor-days per hectare per season against 116 labor-days for cereal production. Particularly for youth, vegetable farming may offer a profitable business opportunity.

Market-oriented vegetable farming not only creates income for

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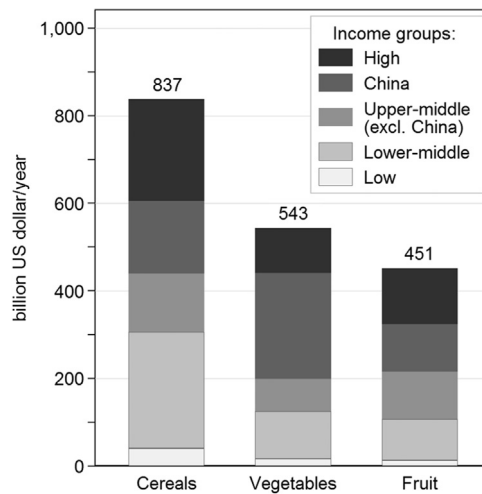


Fig. 1. Farmgate value of the global production of food cereals, vegetables and fruit, average 2012–2013, by national income categories, current US dollars. **Source:** FAO (2017): Database on the value of agricultural production. **Notes:** World Bank 2016 classification used to group countries. FAO data on Gross Production Value (current million US\$) are incomplete. Missing values were imputed using linear regression models for each crop using the Gross Production Value (constant 2004–2006 1000 I\$) as predictor, which is more complete. Feed maize excluded from cereals. Watermelons, melons and avocados classified as fruit.

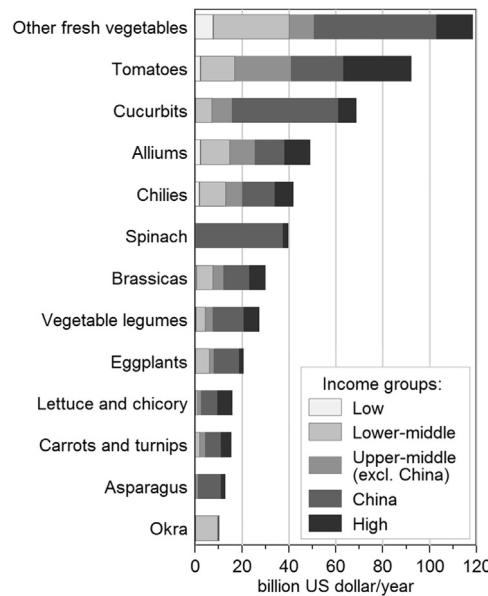


Fig. 2. Farmgate value of global vegetable production by income groups of countries, average 2012–2013, current US dollars. **Source:** FAO (2017): Gross Production Value (current million US\$). **Notes:** See notes under Fig. 1. Similar crops were added together; for instance, cucurbits include pumpkin, squash, gourds, cucumbers and gherkins. However, cucurbits excludes watermelons and melons. Not all countries report values for each vegetable and instead report an aggregate for “other fresh vegetables”.

smallholder farmers but also helps to build their resilience to external risks. Diversity of vegetable crops, short growing cycles, and efficient use of irrigation can reduce farmers’ vulnerability to climate change. For economic resilience, farmers may either opt to integrate vegetables into existing staple cropping systems or move into specialized vegetable production.

Vegetable production, processing and marketing offer potential opportunities that can be especially attractive to youth: production requires only small amounts of land, is technology-savvy, and high profits can be obtained in a relatively short period of time. Furthermore, low levels of mechanization in vegetable production and the need for careful handling of produce often create a specific demand for female labor. Public investments in infrastructure, training and subsidies in support of vegetable value chains could advance such employment.

The potential of vegetables to generate positive economic and

nutritional impacts, however, has been limited by the relatively low levels of support that national governments and international donors direct to public sector vegetable research and development. Public and private investments in agriculture are still largely focused on staple crops and oil crops, not on commodities rich in micronutrients (Haddad et al., 2016; Pingali, 2015). To the extent that private sector investments in lower income countries are directed at vegetables, these tend to be focused on a narrow range of globally-important vegetables such as tomatoes, onions, green beans, peppers, lettuce and cucumbers.

The World Vegetable Center (“WorldVeg”) is an international public research organization focused exclusively on expanding vegetable production and promoting increased consumption of vegetables. Founded in 1971 by several East and Southeast Asian countries, the United States and the Asian Development Bank as the Asian Vegetable Research and Development

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